

## REMARKS

Claims 99-101, and 105-112 are now pending. Claims 89-98 and 102-104 have been withdrawn from consideration by the Examiner and are now cancelled. In this response, dependent claims 108 and 110 were amended to correct minor typographical errors. Independent claims 99, 105, and 112 were amended as discussed below.

Applicants note that in their amendment filed July 28, 2003 some *wherein* clauses intended to be added to claim 99 were not properly underlined. From comments made by the Examiner in the Section 103 rejection of the outstanding Final Office Action, it is believed that the recitations in these clauses were not considered. Hence, Applicants assume that the wherein clauses submitted with the amendment to claim 99, as filed July 28, 2003, were not entered. Therefore, Applicants have again presented clauses for entry in claim 99, this time with proper underlining as required by 37 CFR 1.121(c).

### *Section 112 Rejections*

Claims 99-101, and 105-112 were rejected under 35 USC 112, second paragraph. Specifically, independent claims 99, 105, and 112 were rejected for reciting “*two* or more parental character strings representing *one* or more polynucleotides or polypeptides.” This mismatch in the numbers has been corrected in each of the independent claims. A similar mismatch in number was identified between the character strings recited in operations (a) and (c). This problem has been corrected as well. Withdrawal of the rejections is respectfully requested.

Finally, claim 112 was rejected under section 112, second paragraph for missing operation (b). As indicated in Applicants’ last response, claim 112 was intentionally written without reciting a separate alignment operation (e.g., without an operation corresponding to operations (b) in claims 99 and 105). Hence, Claim 112 only recites 3 operations. However, those operations should be identified as (a), (b), and (c), rather than (a), (c), and (d) as now written. Claim 112 has been amended to correct this problem. Withdrawal of this last rejection under section 112 is respectfully requested.

### *Section 103 Rejections*

Claims 99-101 and 105-112 were rejected under 35 USC 103(a) as being unpatentable over the combination of Venkatasubramanian et al. (J. Chem. Inf. Comput. Sci., Vol. 35, pp. 188-195) in view of US Patent No. 6,403,312 issued to Dahiyat et al.

In the Final Rejection, the Examiner makes the following statement:

Applicants argument detailed on pages 7-8 of the communication filed 8/4/03 is essentially on the ground that the Venkatasubramanian reference does not teach selecting a crossover point by “pairwise homology”. However, such limitation is not required in the claims. Page 5 of the November 11, 2003 Office Action.

Applicants wish to point out that claim 99, as previously amended, recited that “the crossover point is selected from a region *outside* of an identified pairwise homology region.” Further, claim 105 recited that “the crossover point is selected from a region *of* identified pairwise homology.” It is respectfully submitted that these recitations clearly specify considerations of pairwise homology in selection of the crossover points.

Possibly, the Examiner is not giving these limitations weight because they are not positively recited in one of the four operations recited in the claims. (The limitations were presented in “wherein” clauses, and, as indicated above, the wherein clauses may not have been entered in claim 99.) To address this possibility, Applicants have amended claim 99 to positively recite in operation (c) that a crossover operator is applied “to a point selected outside an identified pairwise homology region.” Claim 105 was similarly amended but specifies that the crossover operator is applied to a point *within* the identified pairwise homology region. In either case, the crossover operator applies to a point selected with respect to an identified region of pairwise homology. It is respectfully submitted that the claims now clearly recite the consideration of pairwise homology in selecting a crossover point and this distinction from the Venkatasubramanian must be considered. If the Examiner still believes that this inventive feature is somehow not clearly recited in the claims, it is requested that he call the undersign and discuss the matter.

Additionally, operation (b) in claims 99 and 105 has been amended to positively recite that aligning the parental character strings identifies “one or more regions of pairwise homology.” This operation is thereby linked to operation (c),

which uses at least one region so identified in selecting a point for applying the crossover operator.

The explanations presented in Applicants' previous response are reasserted and must now be considered in light of the pertinent claim recitations. As discussed in the previous response, neither the Venkatasubramanian reference nor the Dahiyat et al. reference suggests selecting a crossover point on the basis of identified regions of pairwise homology. Further, neither reference suggests aligning character strings to identify a region of pairwise homology. In view of these distinctions, it is respectfully submitted that claims 99 and 105 and their dependent claims are patentable over the art of record.

#### *Claim Objections Warning*

At the end of the Action, the Examiner presents a "claim objection, warning" stating that if claims 99-101 are found allowable, claims 105-107 will be objected to under Rule 1.75 as being a substantial duplicate thereof. Also, according to the "warning," claim 112 would be viewed as a duplicate of claims 99 and 105. Rule 75 states in pertinent part that "more than one claim may be presented provided they differ substantially from each other . . ." 37 CFR 1.75(b). MPEP 2173.05(n) elaborates on this by pointing out that the underlying doctrine is "restricted to cases where the claims are unduly multiplied or are substantial duplicates."

Applicants respect the underlying policy of Rule 75(b) and have no intention of prosecuting claims that are substantial duplicates. It is believed that independent claims 99, and 105, and 112 each cover significantly different subject matter.

Claim 99 recites "applying a crossover operator to a point selected *outside* an identified pairwise homology region." Claim 105 recites "applying a crossover operator to a point selected *within* an identified pairwise homology region." And claim 112 does not recite an aligning operation.

While much of the text in the independent claims is identical (particularly in claims 99 and 105) there are also substantially different limitations within the claims. The individual claims require selection of a crossover point based upon qualitatively distinct criteria. In fact, the criteria recited in claims 99 and 105 are orthogonal to one another. Thus, these differences represent more than mere differences in wording.

Further, if claims 99 and 105 were alternate dependent claims, the substantive differences would be much more striking and this question would not arise. Applicants should not be penalized merely because the claims in question are alternate independent claims with much overlapping text. It is respectfully requested that when claims 99-101 are found allowable, that claims 105-107 and 112 not be rejected as being duplicates of the allowed claims.

As indicated in the previous response, independent claim 112 is similar to pending claims 99 and 105, but does not recite a separate alignment operation or a selecting a crossover point based on homology considerations. Thus, claim 112 is broader in some regards than claims 99 and 105. Nevertheless, it is believed that this claim is patentable over the art of record. As indicated, neither the Venkatasubramanian et al. paper nor the Dahiyat et al. patent suggest, for example, identifying an "oligonucleotide comprising a chimeric nucleic acid sequence that comprises subsequences from at least two of the parental character strings."

*Conclusion*

Applicants respectfully request a notice of allowance. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,  
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